Dialectical Polyptych: an interactive movie installation

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ABSTRACT
Most of the known video games developed by important software companies usually establish an approach to the cinematic language in an attempt to create a perfect combination of narrative, visual technique and interaction. Unlike most video games, interactive film narratives normally involve an interruption in time whenever the spectator has to make choices. "Dialectical Polyptych" is an interactive movie included in a project called "Characters looking for a spect-actor", which aims to give the spectator on-the-fly control over film editing, thus exploiting the role of the spectator as an active subject in the presented narrative. This paper presents an installation based on a mobile device, which allows seamless real-time interactivity with the movie. Different finger touches in the screen allow the spectator to alternate between two parallel narratives, both producing a complementary narrative, and change the angle or shot within each narrative.

Keywords: Audiovisual, Interactive film, Multinarrative, Mobile devices, Art installation.

INTRODUCTION
After a century of film materialized in frames, we see today through the digital cinema the images and sounds in computer binary storage. This change is the end of something, nostalgic for some and a new opportunity for others. Digital media have contributed to new media and new practices, expanding the boundaries and aesthetic possibilities. The digital capabilities let us explore multiple languages incorporated simultaneously in one technological support and meet an increasing willingness to participate by the user. Digital image allows manipulation flexibility inaccessible to analog technology. Its binary nature allows a non-linear reading and handling. The digital provides new ways of looking, questioning and feeling.

In this paper, it is presented “Dialectical Polyptych: an interactive movie installation” consisting of an interactive movie artefact with two parallel narratives. Each narrative has five different shooting angles/shot. The spectator can choose the narrative and the angle/shot at every moment, through interaction, with no interruption in the narrative flow. The interaction is made through simple or multi-touch gestures on a mobile device screen. Thus, it is the spectator that plays the role of the movie editing in real time.

The main contribution of the paper is the artefact itself, i.e., the real time movie editing by the spectator with no interruption in the narrative flow. To the best of the authors knowledge, there is no similar work in the literature available. Other contributions are: 1) use of film aesthetic without graphic elements to achieve interactivity and 2) transparent and intuitive interfaces.

The next Section presents the contextualization of the work as well as the state of the art. The third Section detailed all the steps for the development of the “Dialectical Polyptych” artefact. Section four presents some preliminary evaluation as user feedback, finally, in the last Section, conclusions and future work are presented.

CONTEXTUALIZATION

"Dialectical Polyptych: an interactive movie installation" seeks to explore new possibilities of interaction in the film view in an immersive and intuitive way, offering the viewer the role of film editing in real time through transparent interfaces.

The film narrative and the editing

The editing is one of two basic components in audio-visual production (Bedoya, 2003), the other component in the audio-visual language is the framing or selection unit. According to Deleuze (Deleuze, 2014), the evolution of cinema grow up with the editing, the mobile camera and the emancipation of taking views. Griffith had contributed to the editing by giving emotional impact through the long shot, medium shot, close-up, subjective camera (point of view of the character) and travelling (moving camera) (Gosciola, 2003). Thus, Griffith wanted to involve the spectator emotionally through scale changes in the shot, giving the public a progressive emotion. Porter expanded the idea of linear narrative with the use of parallel-editing to depict two simultaneous events or points of view (Musser, 2012; Jenkins, 2013). This technique alternates two or more scenes that often happen simultaneously but in different locations. Like Porter’s technique, “Dialectical Polyptych” prototype also invokes parallel editing but from the result of spectator interaction.

For interactive cinema, technological advances are not enough. It is also necessary to point out new solutions to the narratives. In the beginning of the XX century, Kuleshov (1994) argues that "the essence of cinema, the medium that allows obtaining an artistic impression, is the editing". For Eisenstein (2002) editing is "the primary means for a really important creative transformation of nature" and "cinematography is, first of all, editing". Pudovkin said: “the editing builds scenes from the separate pieces” (Pudovkin, 1929). The combination of these pieces forms different meanings depending on the chosen sequence. Thus, if given the user the possibility, there will be a similar editing to what happens on the Internet with hypertext, where the user also chooses the “pieces” of text to be read.

The film narrative and the interactivity

Interactivity represents a way to free the user/spectator. He is no longer a simple passive spectator. In non-interactive narratives the user/spectator is subjugated to the author's decisions,

it’s the author that has the power to make decisions about the course of history and its sequel. With the use of interactivity the user/spectator wins options, he is allowed to make choices. Interactivity applied to narratives, provides a set of possibilities and options, able to build a sequence of events that will make up a story.

However, Manovich (2002) considers the interaction an illusion, to the extent that the spectator does not have the power of option and selection, as these are preset and limited by the author at the outset. Cameron (1995) goes further by saying that interaction is synonymous with lack of choice and interactivity, since most of the time it is just an offer of some alternative linear paths, different endings or characters points of view with a different linear structure. "On Totalitarian Interactivity" Manovich (1996) speaks of geographical differentiation of the concept of interactivity. For Westerners, according to Manovich, interactivity is a perfect vehicle for the spread of democracy and equality ideas. As for the East, it is a form of manipulation in which the artist uses technological advances to impose its totalitarian will. Maybe it is ironic that the interactive movie *Kinoautomat*, which calls for a democratic vote to decide the course of the narrative, was presented at a Czechoslovak communist era. Possibly this is a political promise through interactive cinema by meeting of what Andrew Cameron (1995) calls interactivity policy. Slavoj Zizek also talks about the implications of this issue in society. In "cyberspace, or the unbearable Closure of Being" Zizek says that with the illusion of choice offered by computers, disappeared the author's authority resulting in a decrease of freedom: "It is When there is no one to tell you what you really want, When all the burden of the choice is on you, that the big Other dominates you completely, and the choice effectively disappears " (Zizek, 1997). In a more optimistic way, Janet Murray (2003) refers interactivity as a set of "agency" and "transformation" Agency as "rewarding ability to perform meaningful action and see the results of our decisions and choices". The transformation through computers that "offer countless ways to change". As in video games, interactivity can give spectator the opportunity to participate in a new reality with a role of creator and organizer of his own story by choosing his own destiny even if it is in the form of illusion. By interfering in the narrative with his decisions/actions, the spectator becomes an active author in the creative process. By mixing his reality with the reality of narrative through his creative participation, spectator becomes at least co-responsible for diegetic world.

With regard to the narratives, interactivity change profoundly the shape of conventional film narratives - linear and non-interactive (even when the story is not told chronologically, the sequence is fixed and linear). The main difference between the two is in the temporal representation. It is important here to distinguish the time of the story, which refers to the chronological time events of the story imagined or lived, and the time of representation, referred to the discourse time of the events that are selected to tell the story and its temporal organization. Non-interactive narratives refer to a representation time that is not current: all content and organization of the narrative has been created in advance. Spectator's relationship with the non-interactive narrative is always in the present taking into account the time lag of his past. In interactive narratives representational time is "now", the action takes place in the present. The narrative depends on and is determined by the action of the user. Given these actions, interactivity confers uniqueness as one point of interaction happens only once, even if the space, the audience, the film, etc. is the same, resulting in a dynamic system in which a multitude of sequences are allowed. As stated by Richard Schechner (2002), the uniqueness of an event is not in its materiality but in its interactivity. And it is this uniqueness that interactivity will always referring to the "now" “[n]ow, not just in the sense that the viewer witnesses events now, but in

the sense that the events are happening now, and that what comes next is not yet determined" (Juul, 2001). Interactive participation in a certain experience in the current moment of time refers to the future that emerges from this participation. Interactivity, through the moments of decision, interferes with the narrative construction, in its uniqueness, in its significance.

Interactive narratives usually involve spectator participation in temporal, spatial or multinarrative selection, where the idea of film approaches the form of games, fusing languages and narrative strategies. Combining the interactivity of video games with the surroundings and depth of a conventional film clearly results in a redefinition of the role of passive spectator. The multinarrative is not exactly a novelty, it has already been tried in the fifties by Akira Kurosawa with the film "Rashomon", or more recently by Peter Howitt with "Sliding Doors" (1998) or Mike Figgis with "Timecode" (2000) or even the Danish project "D-Dag" launched on 2000 for seven Danish TV channels. What is new is the increased possibilities of interaction that digital technologies offer the audience/spectator in the creative process. It is from the moment the spectator interacts intervening change in the story, the narrative is no longer a set of events arranged in advance by its author to become an experience of events taking place in the present. Story time becomes real time, in the way spectator action is synchronized with the representation, and the role of spectator become the participant, shaping the future events of the story. Real time is here understood for relationship between the spectator interaction and the almost instantly influence in the narrative, creating the narrative in the present tense. Interactivity is only possible in the present.

Contrary to what happens in non-interactive storytelling in which expression is pivoted by a linear accumulation of signs, in interactive storytelling there is a strengthening in the different possible narrative sequences (Ryan, 2006), requiring the spectator an increased effort in its interpretation. Interactivity become collaboration between viewer and narrative in which spectator gain the ability to act and react, through an interface in confrontation or alliance with characters or narrative environment.

For effective immersion visual stimulus is necessary. Thus, synchronization between interactivity and audiovisual response is essential to create the agency (Murray, 2003). The lower the response time between interaction and the narrative reaction, the lower the separation between spectator and the representation. Timing and interface transparency are two fundamental aspects to immersion in interactive narrative experiences.

Previous work

There are few examples of movie interactivity developed for mobile devices; one of those is Häkkilä et al. (2014), which presents interaction with content in the context of 3D cinemas by means of a mobile phone. Viewers can use their personal devices to retrieve, for example, information on the artist of the soundtrack currently playing or a discount coupon on the watch the main actor is wearing.

Another example is "Five Minutes" (2014), an interactive movie about Zombies optimized for mobile devices, from director Maximilian Niemann. It is a project that integrates game and film into one product. Sponsored by a watch brand, the film explores the question of time and the pressure on the speed of action needed for the survival of the protagonist. The viewer fits the role of triggering the action of the film through graphic challenges.

In 2016 is released the interactive film "Late Shift" (2016) directed by Tobias Weber. It's an action movie developed for mobile devices. The interaction is provided, at certain moments of the film, through buttons that offer the viewer the possibility of making choices that will have

reflection in the sequence of the narrative. The spectator has a short time to make the choice. If spectator does not select any of the options displayed, the movie advances with a preset option.

Nevertheless, these works are different from the one presented in this paper, because graphic elements to achieve interactivity are present.

Finally, it is also important to mention our previous work, where a volumetric/3D sensor (Kinect) was used to achieve the movie interactivity (António et al., 2015). The sensor was used for tracking (in a 3D space) the spectators movements and positions, which allows seamless real time interactivity with the movie. Different positions of the body prompt a change in the angle or shot within each narrative, and hand swipes allow the spectator to alternate between the two parallel narratives, both producing a complementary narrative.

DIALECTICAL POLYPTYCH

In traditional filmic narratives, the viewer sees a group of actors as he is watching from a window. Usually one or two of these protagonists are central elements of the story and gain the psychological identification focus of the spectator. The purpose of this artefact is to try new possibilities of filmic view, particularly in the field of interactive narratives, giving spectator a larger range of possibilities and pushing the spectator from a passive to an active role.

Concept

It is intended to create an interactive movie that assigns an important active role to spectators. The prominence given to the spectator is not in the form of character/actor of the story but as an editor. The spectator participates in the story in an editor perspective.

Participation of the spectator does not interfere with the continuity of the movie. Interactivity becomes an element in the movie: along with the images and the sound, interaction of the spectator will have an impact on the editing of the movie (Weinbren, 1995). The possibility given to the spectator to make its own editing, results in a transfer of narrative authority, although based on discovery and exploration, sometimes random. Despite the element of randomness introduced into the system by the viewer, aesthetic intentionality is not threatened. Unlike most interactive movies, there isn't a limitation in interaction moments. There is no correct filmic sequence. Spectator in the role of editor has the interactive freedom to select at every moment the piece of history and the point of view that seems most important or interesting. Thus, it is not a matter of making choices, such as the interactive movie Kinoautomat (Činčera, Roháč, & Svitáček, 1967), in which spectator chooses at certain times the red or the green button, but a process of constant exploration. Without interruption in the reproduction of the movie, the spectator can jump flow in flow into two parallel narratives starring two characters. While each of these independent narratives can be seen by itself in isolation, the set of two narratives form an overall narrative. The different narratives intersect and form part of the same fictional world. Each narrative has several camera angles or perspectives of the narrative. Playing two narratives with 5 angles or perspectives of each shooting, makes 10 simultaneous narrative flows.

It is by choosing character and the desired camera angle that gives the real time editing. Spectator interaction results in a spatial mapping of the narrative, keeping unchanged temporal linearity. *Figure 1* shows an example resulting from spectator interaction.

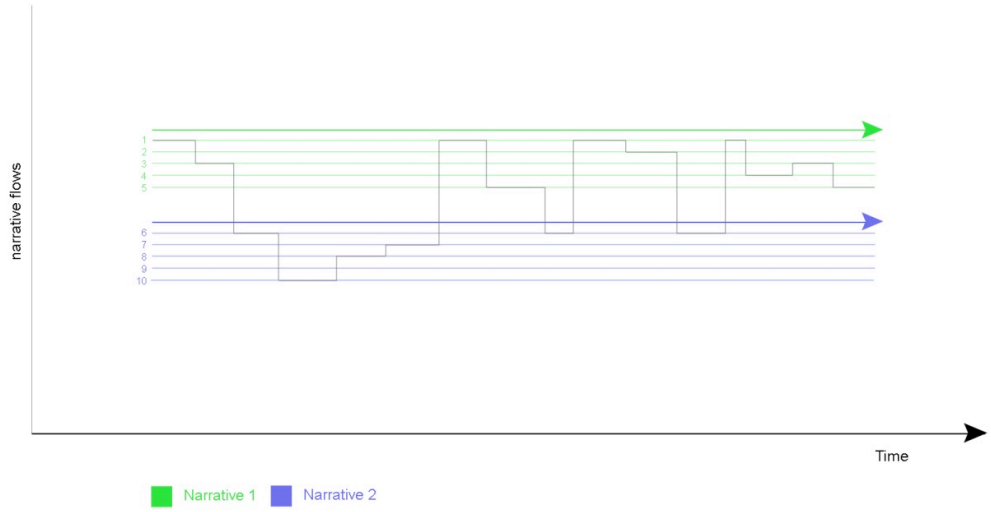

Fig. 1: Interactive flow sequence example.

Editing combinations give the movie an open work feature defined by Eco (2009), referring to indeterminacy of a work, as it has many interpretations and a renewed presentation in every fruition: "because in every reception the work takes on a fresh perspective for itself".

In this artefact, viewer immersing does not get to the level of the narrative, i.e. spectator does not become an actor. Spectator controls the narrative at the technical level, becoming an editor of a movie sequence. Although there is a spectator's operational control, random element plays an important role in cinematic viewing experience.

The spectator chooses what he want to see in a certain moment of the film. So, as consequence of that act other parts are not shown. Spectator is left with a partial view of the narrative. Many images and facts will be indeterminate in story. However, this type of uncertainty about which we can only do inferences and subjective readings is what provides the richness of the narrative and the characters. It is this “indeterminate zone” that makes the characters inexhaustible and fascinating (Rosenfeld, 2009). Bordwell states that in filmic narration process a story encompasses a set of events, some of which are presented directly, others in the form of clues. There are also events that the author ignored (Bordwell, 2001). The author and the spectator create a convergent mental representation in sequences of events that the author decides to present directly or indirectly. In “Dialectical Polyptych” case, the movie is composed by multinarratives layers, so it is the spectators that choose the events to be part of the narrative sequence and organize the material of the film. Thus, is the spectator that by selecting characters and environments defines the representation, namely how the story is told and therefore their emotional process.

The interface intends to be transparent to contribute to greater immersion of the spectator in the movie. The transparency of the interface results from the absence of buttons or textual indications to the achievement of interactivity.

Many interactive films make use of an interaction design that can reduce the viewer's immersiveness by interrupting the narrative to allow choices and/or use of graphics to alert decision points or allow interaction with them (Tully & Turner, 2004). The study presented here focuses on the possibility of creating an interactive experience of filmic visualization without

interference of visual elements external to the filmic universe allowing an immersive participation with transparent interfaces.

Implementation

“Dialectical Polyptych” is intended for presentation on expositions events in the form of installation. A picture placed on the wall invites the interaction of the viewer. This can interact through touch gestures on the screen. A computer application manages the interaction interpreting touch gestures on the screen. The artefact consists of an iPad inserted in a wooden frame constructed for this purpose (see *Figure 2*).

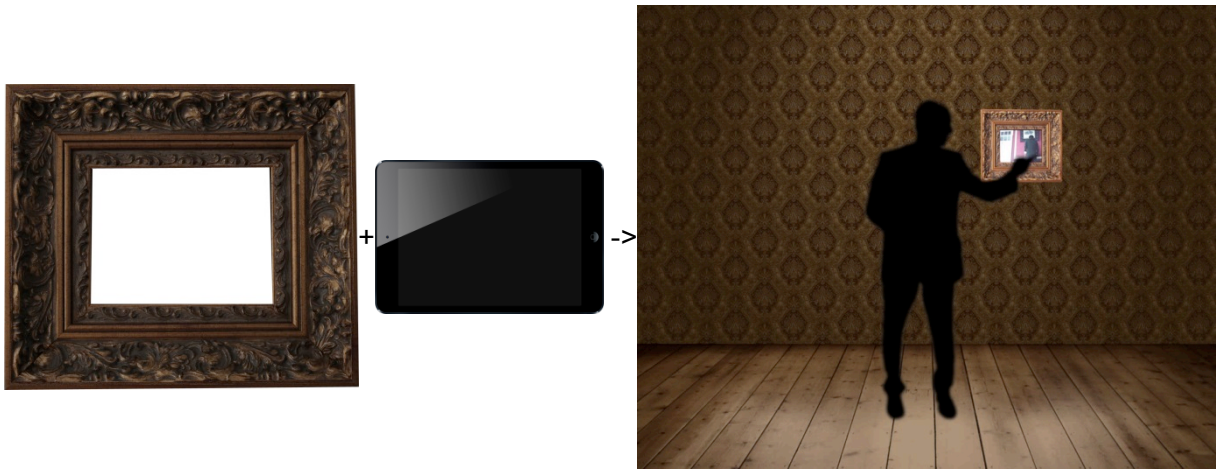

Fig. 2: The artefact representation.

According to Bazin, cinema is a form of evolution of plastic realism, which began with the Renaissance and reached its peak in the Baroque painting (Bazin, 2014). The most important event of this period was the invention of perspective, which allowed the artist to create an illusion of three-dimensional space and thus the arrangement of the objects as displayed in the visible world. Although the film image is closer to photography than painting, we find common aspects between cinema and painting as "the frame and the screen, the representation and the scene, light and color" (Ortiz & Piqueras, 2003). The picture/frame in painting and screen/ framing/shot in film image delimit a part of the image we perceive. However, if in painting, out of field is only represented imaginary (Ortiz & Piqueras, 2003), in the filmic image out of field can be viewed with a simple camera movement. Therefore Bazin argued that the paintings are centripetal, since their representations remain within the limits set by the picture/frame while the film images are centrifugal, because they have a relationship with the outside space, extending beyond the image border. The frame fits the film and relates the inner space and outer space. It is an artifice that is both included and excluded from space representation, making it "an instrument of mediation between the interior space, occupied by the statement, and outer space" (GROUPE μ, 1992). The frame establishes continuity between the wall and the screen, between film and reality. For Ortega y Gasset (as cited in Bazin, 1991) there is a triumph of the gilded frame, "it is the material that produces maximum reflection and the reflection is this note of color, of light that does not bring itself any shape, it is pure shapeless color". Reading is triggered by the delimitation of vision domain that results in a "dialectical game between an evoked space and

represented space" (Cañizal, 2012). The look of the spectator can be extended by the diegetic space in the various "frames" that make up the polyptych film. In arts the term polyptych refers to a painting composed of several fixed or movable panels, concerning the same subject. Although we have only one frame, i.e., a screen, the polyptych effect is achieved through the interaction of the spectator. This can choose the character and the camera angle corresponding to different frames of the polyptych. Thus we have two types of frames, the frame of filmic framing, which sets the margins through the shots, and the frame that surrounds the image in its internal environment at the same time that extends to its external environment by its polyptych and dialectic properties.

The implementation of the "Dialectical Polyptych: an interactive movie installation" artefact has three major phases (see *Figure 3*): (a) Pre-production, which includes a brief description of the script preparation, filmic storyboard, and technical aspects that were taken into account in shooting of the artefact. (b) Filming and editing, where some technical aspects about this phase are presented. (c) Prototyping and installation, it consists in the implementation of the artefact, as well as some considerations about installation.

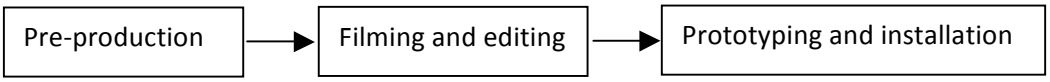

Fig. 3: Project development stages.

A. Pre-production

For the production of the movie the first step was script writing and respective storyboard. Script consists of two parallel narratives that address the issue of loss of a loved person. Both have the same characters although action takes place at different time and space. There is a narrative parallelism between them. In the filming script, different angles and shots were covered for each scene, and for each of the two narratives. Since these are two parallel narratives, there was a special care in the synchronization. After writing the script, creation of the storyboard was the next step in order to predict the filming shots and avoid possible match cut editing errors. A detailed explanation of the storyboard is out of the focus of this paper. *Figure 4* shows the relative positions and angles where the cameras where situated, the shooting sequence was done with six cameras simultaneously.

B. Filming and editing

For filming were used DSLR (Digital Single Lens Reflex) cameras, with FullHD 1920x1080 resolution, equipped with 28mm, 50mm, 135mm and 210mm lenses depending on the distance from the camera to the subject (see *Figure 5*). The filming was carried out, where possible, with multiple cameras simultaneously in order to facilitate synchronization between the images. Each of these cameras captured different camera angles. The cameras were placed on tripods, sliders, shoulder rig, steadicam stabilizer and on the ground, depending on the requirement of the shooting and camera movement. In other situations we proceeded to separate shots that served as a complement for different flows of the narrative, for example, details or flashback.

For editing, all narrative flow was overlapped in different layers, in order to achieve synchronization of the film action. Each narrative consists of five flows. A single sound track

was maintained. After synchronization and editing of different scenes for the two narratives, all obtained flows were exported.

C. *Prototyping and Installation*

The different narrative flows are presented through the interaction of the spectator. An iPad was used for the interaction; this device allows interpreting touch gestures on the screen. For the development of the artefact it was used Xcode (Apple Inc.) programming environment (Xcode, 2015).

Slide gestures allow change the angle or shot within each narrative. *Figure 5* shows an example of different shoot angles resulting from finger slide gestures. The spectator can slide vertically and horizontally. Based on the slide direction, it is computed which flow to be presented in each narrative, at each moment. Single tap gesture shows the central flow of the narrative.

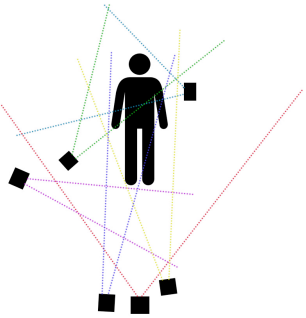

Fig. 4: Shooting with six cameras simultaneously.

Fig. 5: Changing angle or shot through slide gestures.

It is very important to mention that all the interactions and respective narrative flows (streams) occurs on-the-fly without any stop in the movie action. For a better understanding, imagine that 10 movies started at the same time and running in parallel (at the same time) in 10 cinema rooms each one telling a different point or time of the exactly same story at the exactly same time in the story, and the spectator through finger gestures can travel from one room to the other.

Two-finger tap allows interim between the two parallel narratives. *Figure 6* presents alternative narrative flows.

Fig. 6: Interim between the two narratives through two-finger tap.

Evaluation

The prototype was presented for evaluation purposes to a group of twenty individuals. Each one could freely experience the artefact. After experimentation there was a moment of discussion and sharing of opinions. Several suggestions emerged from this discussion and were recorded in subsequent questionnaires. The main criticism pointed to the artefact was the impossibility of direct choice of a character; the artefact only foresees the passage to the next one. The responses to the questionnaires revealed that a significant part considered that the interaction draws attention to the narrative and practically everyone would like to review the film to better understand the story, namely the unseen parts. The deviance of the narrative motivated by the interaction may be due to the novelty factor of the proposed model. Ryan (2001) considers that the structure of the interactive film may be more interesting to the viewer than the plot. That is, the novelty factor of the interaction with the created system may overlap the viewer's immersion in the film's story.

Two-thirds of respondents consider the proposed interactivity to be intuitive, understandable, and enrich the movie viewing experience. Much of it would like to see other film narratives with this technology.

Afterwards, voice recognition functionality was added, giving viewers the possibility of choosing the character directly through their name as well as selecting the different angles and shots.

CONCLUSION

This paper presented “Dialectical Polyptych: an interactive movie installation” an interactive movie artefact with two parallel narratives. Each narrative has five different shooting angles/shot. The spectator can choose the narrative and the angle/shot at every moment, through interaction, with no interruption in the narrative flow. The interaction is made with different touch gestures on mobile devices screen thus, it is the spectator that plays the role of the movie editing in real time.

“Dialectical Polyptych” installation was presented at the 18th Biennial of Cerveira from 18 July to 19 September 2015, with the theme "Looking at the Past - Building the Future", under the PhD in Media-Art Digital ambit (see *Figure 7, 8*). Up to the present day, weren’t detected errors

due to interaction, also the flow of the movies does not present any “cut” (wait/delay) when a narrative or a shooting angle changes due to an interaction.

The project achieved essentially three goals: Movie editing in real time, film aesthetic without graphic elements to achieve interactivity and transparent and intuitive interfaces.

It is expected that this work contribute to different forms of film viewing and audio-visual language, following the technological evolution and making use of its potential. The use of mobile devices, due to is transparent interface characteristics, and whose functionality does not need to be understood by the participant although this start to associate their behaviour with the action or reaction of the installation, enables interactivity without the manipulation of buttons or text information, freeing the user for a more natural interaction. To the best of authors knowledge, there is no similar work in the literature.

It is also expected that the research may contribute to a theoretical advance in the researched area.

Future work includes uploading IOS and Android apps to the web. Also in research is how to use this technology in other contexts, like architecture, theme parks or marketing, for example.

Fig. 7: Dialectical Polyptych installation, 18th Biennial of Cerveira.

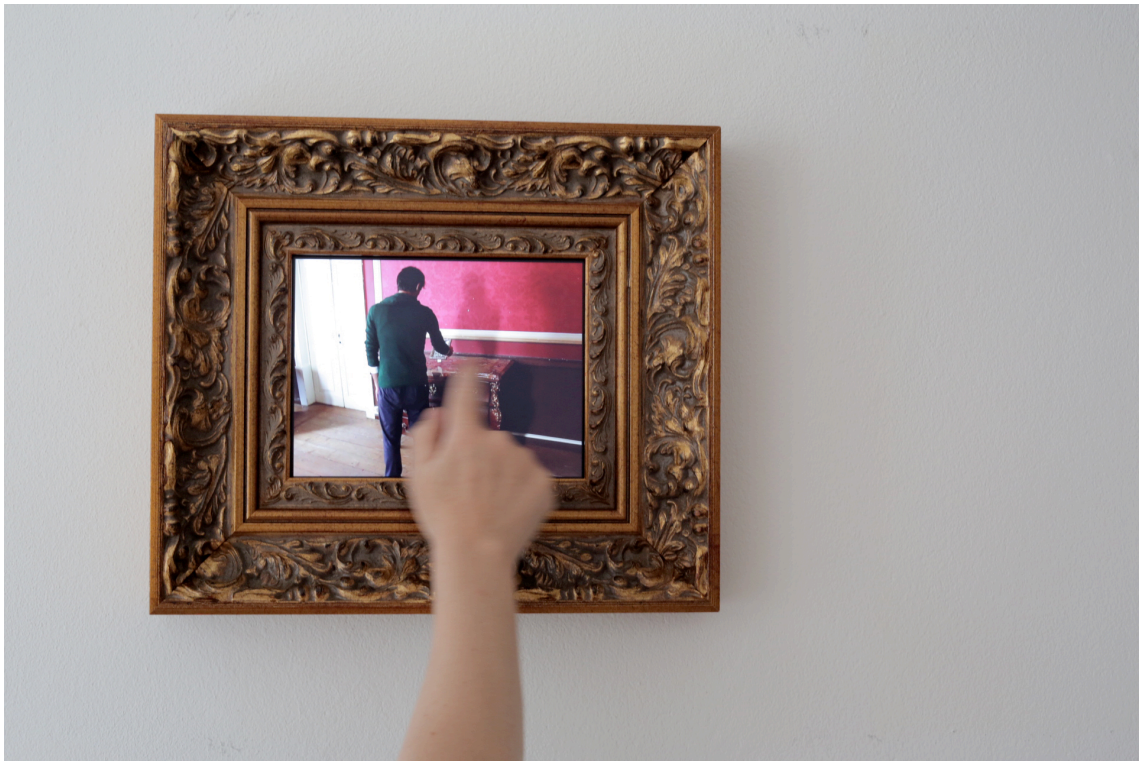

Fig. 8: User interaction.

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